

What is claimed is:

- 1 1. A memory device, comprising:
2 an array of a magnetic storage cells, each cell comprising a first magnetic
3 layer, a second magnetic layer, and a dielectric in between each said
4 first and second magnetic layers;
5 a first set of conductors to receive current for writing data to said magnetic
6 storage cells; and
7 a second set of conductors for heating said at least one magnetic storage cell
8 when writing a bit of data to said at least one.
- 1 2. The memory device of claim 1, wherein the first set of conductors is
2 electrically isolated from the second set of conductors within the array
3 of magnetic storage cells.
- 1 3. The memory device of claim 1, wherein heating said at least one magnetic
2 storage cell reduces the magnetic coercivity of at least one of the first
3 and second magnetic layers comprising the magnetic storage cell.
- 1 4. The memory device of claim 1, wherein the array of magnetic storage cells
2 comprise spin tunneling storage cells.
- 1 5. The memory device of claim 1, wherein the array of magnetic storage cells
2 comprise giant magnetoresistive storage cells.
- 1 6. The memory device of claim 1, wherein said array of magnetic storage cells
2 comprise anisotropic magnetoresistive material.

- 1 7. The memory device of claim 1, wherein said array of magnetic storage cells
2 comprise any magnetoresistive storage material.
- 1 8. The memory device of claim 1 wherein said magnetic storage cells serve as
2 electrical heating elements.
- 1 9. The memory device of claim 8, wherein said at least one magnetic storage cell
2 is heated by current flowing through said second set of conductors and
3 through said at least one magnetic storage cell.
- 1 10. The memory device of claim 1, wherein said second conductor set includes a
2 heater element placed in series with at least one of the conductors of
3 the second conductor set.
- 1 11. The memory device of claim 10, wherein said heater element is a resistive
2 device.
- 1 12. The memory device of claim 1, wherein said magnetic memory device
2 includes a heater element placed in series with at least one of the said
3 magnetic storage cells.
- 1 13. A method for storing data comprising:
2 applying a voltage on a sense current conductors and across a storage cell to
3 heat the storage cell;
4 after the storage cell is heated, writing data to said storage cell; and
5 then removing said voltage across said storage cell.
- 1 14. The method of claim 13, wherein said storage cell is a magnetic storage cell.

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1 15. The method of claim 13, wherein said storage cell is a spin tunneling storage
2 cell.

1 16. A method for writing data to a magnetic memory device comprising:
2 applying a first current to at least one conductor within a second set of
3 conductors, said first current providing energy to heat the magnetic
4 storage cell;
5 after the magnetic storage cell is heated, applying a second current to at least
6 one conductor in a first set of conductors, said second current
7 providing a magnetic field to write data to said storage cell; and
8 then removing said first current to a second conductor.

1 17. The method of claim 16, wherein said storage cell is a magnetic storage cell.

1 18. The method of claim 16, wherein said storage cell is a spin tunneling storage
2 cell.

1 19. An electronic device comprising:
2 a processor;
3 an input device coupled to said processor;
4 an output device coupled to said processor;
5 and a memory device coupled to said processor, wherein said memory device
6 comprises;
7 an array of a magnetic storage cells, each region comprising a first magnetic
8 layer, a second magnetic layer, and a dielectric in between each said
9 first and second magnetic layers;
10 a first set of conductors to receive current for writing data to said magnetic
11 storage cells; and

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12 a second set of conductors for applying a voltage across said at least one
13 magnetic storage cell for heating said at least one magnetic storage cell
14 prior to writing a bit of data to said at least one.

1 20 The electronic device of claim 19, wherein the array of magnetic storage cells
2 comprise random access memory.

1 21. The electronic device of claim 19, wherein said first magnetic layer has a fixed
2 orientation of magnetization and the second layer has a non-fixed
3 orientation.

1 22. The electronic device of claim 19, wherein at least one of said second set of
2 conductors includes a resistive heating element for heating each
3 magnetic storage cell when current flows through said heating element.

1 23. A magnetic storage cell comprising;
2 a first magnetic layer, a second magnetic layer, and a dielectric in between said
3 first and second magnetic layers;
4 a first set of conductors positioned above and below said first and second
5 magnetic layers for writing to said magnetic storage cell; and
6 a second set of conductors positioned above and below said first and second
7 magnetic layers for applying a voltage across a said magnetic storage
8 cell for heating said selected magnetic storage cell prior to writing a bit
9 of data to said magnetic storage cell and for reading the data bit that is
10 stored on said magnetic storage cell.

1 24. The magnetic storage cell of claim 23, wherein said magnetic storage cell is a
2 spin tunneling storage cell.